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**Selected quality aspects of certain dietary supplements containing amino acids**

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The ease of introducing dietary supplements to the market, insufficient quality control by state institutions such as the Chief Sanitary Inspector, and their high popularity and market value make these products particularly susceptible to negligence and adulteration. In the best-case scenario, this may result in a lack of the expected physiological effect, while in the worst case, it may pose a threat to the health and even the life of consumers. Determining the quality of dietary supplements is a challenge, as they often contain numerous ingredients with varying physicochemical properties. Regardless of this, quality control of dietary supplements should cover the same aspects as the quality control of medicinal products, as both are intended for consumer use, can come in the same forms, and may often contain the same active ingredients. The insufficient data on dietary supplement quality, particularly regarding studies on the release of active substances from the product's form, is unfavorable, as it leaves consumers uncertain about achieving the intended effects when using the supplement.

The aim of this study was to determine the quality aspects of selected dietary supplements containing carnitine, proline, tryptophan, and tyrosine as their main ingredients. The quality assessment included a) the detection of substances present in the examined supplements; b) the determination of the content of the main ingredient in capsules/tablets; c) dissolution test to quantify the amount of the main ingredient released from non-modified release capsules/tablets.

During the analysis, the quality of 68 dietary supplements was assessed. Using liquid chromatography coupled with mass spectrometry, compounds not declared by the manufacturers were identified in their composition. These included substances related to the main ingredient of the dietary supplement, such as its transformation products (e.g., tryptophan metabolites), as well as substances whose presence appeared incidental, likely linked to inadequate production conditions (e.g., melatonin). The content of the main ingredient in the dietary supplements ranged from 28 % to 156 % of the amount declared by the manufacturer. Its release, determined using pharmacopoeial methods, ranged from 1 % to 131 % at pH 1.2

and from 1 % to 119 % at pH 6.8. The use of the *PhysioCell* apparatus for release testing allowed for a more accurate simulation of gastrointestinal conditions.

The results of this study indicate the need to establish standards for verifying the quality of dietary supplements, particularly concerning substance release. Release is a critical factor for the substance to exert its intended effect, which is of utmost importance for consumer well-being.

***Keywords:*** *dietary supplement, quality control, dissolution test, PhysioCell apparatus*